BEHAVIOR THERAPY (1973) 4, 655–671

Increasing Heterosexual Responsiveness in the Treatment of Sexual Deviation: A Review of the Clinical and Experimental Evidence[1,2]

DAVID H. BARLOW[3]

Department of Psychiatry, University of Mississippi Medical Center, Jackson, Mississippi

Despite wide agreement that avoidance of heterosexuality is a major component in the genesis and maintenance of sexual deviation, the development of therapeutic procedures to increase heterosexual responsiveness has been largely neglected in favor of aversion therapy to suppress deviant responsiveness. Therapeutic procedures that have been employed to increase heterosexual responsiveness include: aversion relief techniques in which relief from an aversive stimulus is paired with heterosexual stimuli; "Systematic Desensitization procedures" in which heterosexual avoidance is desensitized either in imagination or in the real situation; social retraining where heterosexual skills are directly encouraged and taught; or pairing techniques in which sexual arousal is elicited and associated with heterosexual stimuli. Clinical and experimental evidence for the effectiveness of these procedures, as well as some newly developed techniques which cannot be classified in the above categories, is evaluated and the relationship of these procedures to aversion therapy in the treatment of sexual deviation is discussed.

A strikingly similar viewpoint on homosexual behavior and to some extent deviant sexual behavior in general is held by psychoanalytic and behavioral theorists. This view emphasizes the importance of fear of or avoidance of heterosexuality in the genesis and maintenance of such behavior. Analysts such as Rado (1949), Ovesey, Gaylin, and Hendin (1963), and Bieber, Bieber, Dain, Dince, Drellich, Grand, Grundlach, Kremer, Wilber, and Bieber (1963), and behaviorists such as Wolpe (1969), Ramsey and Van Velzen (1968), and Feldman and MacCulloch (1971), view heterosexual fear and avoidance as major determinants of homosexuality. In addition, both Ovesey *et al.* (1963) and Stevenson and

[1] Preparation of this manuscript was supported by National Institute of Mental Health Grant MH-20258.

[2] The assistance of Stewart Agras and Ed Blanchard, who read an earlier version of this manuscript, is gratefully acknowledged.

[3] Send reprint requests to David H. Barlow, Department of Psychiatry, University Medical Center, Jackson, Mississippi 39216.

Wolpe (1960) speak of the necessity of increasing more appropriate and assertive heterosocial behaviors in the treatment of sexual deviation.

Despite these views, aversion therapy aimed at eliminating sexual deviation is increasingly advocated as the treatment of choice (Barlow, 1972), due in part to the growing application of the experimental behavioral sciences to the clinic and in part to the relative success of this technique (MacCulloch & Feldman, 1967; Feldman & MacCulloch, 1971) compared to psychoanalytic psychotherapy (Bieber *et al.*, 1963). In a period of 10 yr, seven series of cases containing at least ten patients (Freund, 1960; Feldman & MacCulloch, 1965; MacCulloch & Feldman, 1967; Bancroft, 1969; Gelder & Marks, 1969; Evans, 1968; Morganstern, Pierce, & Rees, 1965; Fookes, 1968) and four controlled outcome studies (McConaghy, 1969; Bancroft, 1970; Birk, Huddleston, Miller, & Cohler, 1971; Feldman & MacCulloch, 1971) have reported on the effectiveness of aversion therapy for sexual deviation.

The emphasis on aversion therapy suggests that most clinicians are ignoring a second treatment goal in sexual deviation, that of increasing heterosexual responsiveness. This attitude is exemplified by Bond and Evans (1967) who state "It is probable that if they can abstain from their deviant behavior for a sufficient period of time, normal outlets for the control of sexual arousal will develop" (p. 1162). The potential dangers of this are obvious. As West (1968) points out "Aversion therapy may cause some patients to undertake heterosexual experiments who otherwise might not have done so, but it will leave others impotent and frustrated and in a worse state than they were before" (p. 260).

Findings from two recent studies support earlier theories on the importance of heterosexual responsiveness in the treatment of sexual deviation. Feldman and MacCulloch (1971), in a large, controlled study comparing aversion therapy and psychotherapy, report that the most important predictor of success in treatment is prior heterosexual experience. Of those patients with prior heterosexual experience, fully 80% improved while only 20% with no prior heterosexual experience improved. These results are similar to those of Bieber *et al.* (1963), who reported that 50% of those homosexuals who were bisexual at the time of treatment became exclusively heterosexual, while only 18% of those who were exclusively homosexual at the time of treatment (but may have had heterosexual experiences earlier) became heterosexual.

In this same vein, an important finding was recently reported by Bancroft (1970) who divided homosexuals who had received either aversion therapy directed at homosexual responsiveness or systematic desensitization to heterosexual themes into clinically improved and unimproved

at a follow-up. Those patients who improved had demonstrated significantly greater increases in heterosexual arousal as measured by penile circumference changes and positive heterosexual attitudes during treatment irrespective of mode of treatment. Decreases in homosexual arousal and attitude during treatment occurred equally in both improved and unimproved groups, and were not related to clinical outcome. Although the overall percentage of success was not high, the implication is that when success is achieved, increasing heterosexual responsiveness, by whatever technique, is a more important factor in treatment than decreasing homosexual responsiveness. To the extent that clinical judgments of improvement are valid, these correlational findings suggest the necessity of discovering effective techniques to increase heterosexual responsiveness.

Although clinicians employing aversion therapy emphasize the suppression of deviant arousal, many of these therapies include procedures intended to increase heterosexual arousal. Since these procedures are most often embedded in aversive therapy, it is difficult to determine if they are clinically effective. Furthermore, most case studies and series of cases systematically measure and report only changes in deviant behavior.

On the other hand, a few recent case studies (Kraft, 1967; Huff, 1970) report successful treatment of sexual deviation through the exclusive use of techniques designed to increase heterosexual responsiveness resulting in these single cases in declines in reports of homosexual responsiveness as well as increases in heterosexual responsiveness. These observations, as well as those of Bancroft (1970), raise the possibility that when these techniques are tacked onto aversion therapy they may contribute more to a successful outcome than reports emphasizing aversion therapy would indicate.

This paper critically examines the evidence for the effectiveness of such techniques. These procedures will be classified into four categories, based on similarities in practice or common theoretical underpinnings: Aversion Relief; Systematic Desensitization procedures; Social Retraining, and Pairing. Other techniques which do not fit into these four categories, comprise a fifth category.

AVERSION RELIEF

Aversion relief treatment involves pairing a heterosexual stimulus with relief from a noxious stimulus. This technique has been widely utilized to increase heterosexual responsiveness, probably because it is very convenient to apply in conjunction with aversion therapy. The use of an aversive stimulus insures that a period of relief following the termination

of that stimulus will occur. It is, therefore, easy to pair a heterosexual stimulus with the relief. Because of this, aversion relief has always been used in conjunction with aversion therapy.

Aversion relief was first used in treating sexual deviation by Thorpe, Schmidt, Brown, and Castell (1964) who treated three homosexuals, one transvestite, and one fetish. The aversion therapy procedure consisted of projecting, on a screen, a number of words (up to 23) connotating deviant experiences. Shock accompanied each presentation. The last word in the series, however, described "normal" activities, such as "heterosexual" and signified the end of the shock session. Thorpe *et al.* reported that "tremendous relief" was experienced at this time and, presumably, this word became associated with that relief. Following treatment, all patients reported some increased heterosexual interest although no measure of this was taken and no follow-up reported. Thorpe *et al.* speculated that this procedure worked either by inhibiting heterosexual anxiety, or positively reinforcing heterosexual approach behavior.

In the numerous case studies and series of cases since this report, the heterosexual "relief" stimulus has taken two forms, verbal, usually words or phrases depicting heterosexual interest such as "intercourse" (Gaupp, Stern, & Ratliff, 1971) or pictorial such as slides of nude females (Larson, 1970). Most case studies anecdotally report increases in heterosexual responsiveness.

The aversion therapy and aversion relief procedure devised by Feldman and MacCulloch (1965) is perhaps the best known and has been applied to the largest number of cases; a total of 78 through 1971. The authors state that the goal of the aversion relief procedure is to reduce "heterosexual anxiety."

In a controlled study comparing two groups of homosexuals, each receiving a form of aversion therapy with an aversion relief component, with a third group receiving psychotherapy (Feldman & MacCulloch, 1971), heterosexual interest, as measured by an attitude scale, increased initially in all three groups with no difference among groups. Because the purpose of the experiment was to compare the effects of these therapies on homosexual interest rather than heterosexual interest, experimental design considerations made further comparison of heterosexual interest among the three groups at follow-ups impossible.

McConaghy (1969) compared electrical aversion therapy containing an aversion relief paradigm with chemical aversion therapy which contained no element designed to increase heterosexual behavior in two groups of homosexuals. Subjective reports of heterosexual desire and relations two weeks after treatment revealed no significant difference between the group receiving aversion therapy with aversion relief and the group re-

ceiving aversion therapy in which no attempt was made to increase heterosexual interest.

Solyom and Miller (1965) applied aversion relief to six homosexuals while continually monitoring a physiological response, in this case finger plethysmograph, to heterosexual stimuli. Although they noted a "trend" to greater plethysmograph response to female pictures, when the individual data are examined, only two patients showed increased responding to female pictures over treatment, while three showed decreased responding. This result is further confused by the fact that the two patients who showed increased responding to females did not report any increased heterosexual interest or behavior.

In the only series to assess heterosexual interest continually by means of a valid objective measure, penile circumference change, Abel, Levis, and Clancy (1970) administered aversion therapy to five nonhomosexual deviates by shocking verbalization of the deviant acts at different points in the chain of behavior. After the initial series of shocks, verbalizing a sequence of heterosexual behavior was associated with relief from shock. The results one week after treatment indicate that heterosexual arousal dropped somewhat, although at an 8-wk follow-up heterosexual arousal was higher than baseline levels. Thus, aversion relief had no immediate effect.

In view of the well-documented observation that heterosexual responsiveness increases during aversion therapy in the absence of any attempt to accomplish this goal (Bancroft, 1969; Gelder & Marks, 1969; Barlow, Leitenberg, & Agras, 1969), all clinical reports that aversion relief is effective are suspect since aversion relief has never been used in the absence of aversion therapy to isolate treatment effects.

Currently, then, there is no evidence that aversion relief increases heterosexual responsiveness. Furthermore, the stated goals of aversion relief differ from therapist to therapist; but, if the specific goal of aversion relief is to reduce heterosexual anxiety (Feldman & MacCulloch, 1971) there is no experimental evidence anywhere in the literature that aversion relief does, in fact, reduce anxiety, heterosexual or otherwise, in humans.

It is revealing that in the empirical field of behavior modification, the use of a therapeutic technique has now been reported in the literature on approximately 150 cases and continues to be employed clinically without any evidence that it is effective.

SYSTEMATIC DESENSITIZATION TECHNIQUES

Although the mechanism of action is not clear, (Agras, Leitenberg, Barlow, Curtis, Edwards, & Wright, 1971) systematic desensitization, either in imagination or *in vivo* aims at eliminating fear or anxiety asso-

ciated with heterosexual behavior. This approach is most consistent with the various theories on the genesis and maintenance of homosexual behavior mentioned above, and is further buttressed by two surveys.

Bieber *et al.* (1963) noted that 70 of the 106 patients in his survey reported fear or aversion to female genitalia. Ramsay and Van Velzen (1968) collected questionnaires from 25 homosexuals, 24 heterosexuals, and 17 bisexuals. The answers to a series of questions indicated that homosexuals are not merely indifferent to heterosexual situations, but have strong negative emotional feelings concerning them, much as many heterosexuals find homosexual practices aversive.

Recently Freund, Langevin, Cibiri, and Zajac (1973) documented that homosexuals and heterosexuals both react negatively to nude slides of the nonpreferred sex on attitudinal and penile response measures.

The use of desensitization, or a close variant, has been reported in conjunction with aversion therapy in four instances. In a large series containing 15 homosexuals, 7 exhibitionists, and 5 fetishistic transvestites, Fookes (1968) paired relaxing music with heterosexual slides after a course of electrical aversion. Fookes reported that this variant of desensitization produced increases in heterosexual behavior in some patients. Levin, Hirsch, Shugar, and Kapche (1968) also reported success in desensitizing a homosexual using the standard desensitization in imagination procedure in conjunction with aversion therapy. Using systematic desensitization in the real situation, Cooper (1963) successfully treated a fetish by chemical aversion and by instructing the patient to lie in bed naked with his wife until he felt comfortable and to attempt small steps progressively leading to sexual intercourse only when he felt no anxiety when engaging in the previous step. Gray (1970) used a similar procedure in conjunction with covert sensitization for treatment of a homosexual.

Unlike aversion relief, desensitization has been used in the absence of aversion therapy. Kraft, in several reports (1967a,b; 1969a,b), suggests that decreasing heterosexual anxiety alone may be sufficient not only to increase heterosexual behavior, but to eliminate homosexual behavior, and reports that in several cases of homosexuality (1967a,b) desensitization in imagination apparently accomplished this goal. Huff (1970) and LoPiccolo (1971) also reported increases in heterosexual responsiveness after desensitizing homosexuals in imagination although LoPiccolo's patient began engaging in the target behavior before he was desensitized!

Successful desensitization in the real situation, in the absence of aversion therapy, has been reported by DiScipio (1968) with a homosexual, and Wickramasekera (1968) with an exhibitionist, although DiScipio's patient later relapsed.

Whatever the therapeutic mechanism of action, systematic desensiti-

zation in the real situation offers the naive patient the advantage of learning the intricacies of sexual approach behavior first hand from a cooperative partner.

The only attempt to evaluate the efficacy of systematic desensitization in treating sexual deviation was reported by Bancroft (1970) who treated two groups of 15 homosexuals each. One group received Systematic Desensitization in imagination to heterosexual themes, the second group was treated by electrical aversion therapy. No difference was noted between groups either after treatment or at 6 mo follow-up on reports of homosexual or heterosexual behavior or sexual arousal as measured by penile circumference change. However, when changes from beginning of treatment to the follow-up are examined within groups, both treatments increased heterosexual arousal, as measured by penile circumference change, immediately after treatment, with aversion (surprisingly) increasing heterosexual arousal slightly but not significantly more than the systematic desensitization. Only aversion, however, significantly reduced homosexual arousal immediately after treatment.

Bancroft then dichotomized the groups into improved and unimproved, based on the *reports of behavior* at a 6-mo follow-up and found that *during treatment*, reduction of homosexual arousal occurred in both the improved and unimproved groups, but that significant increases in heterosexual arousal occurred only in the improved group. This suggests that development of heterosexual responsiveness, whether through systematic desensitization or through aversion, is the prerequisite for clinical improvement and that aversion therapy may work not because it decreases homosexual responsiveness but, paradoxically, because it increases heterosexual responsiveness. However, all conclusions are tentative since the study did not include a placebo control or a no-treatment control. Thus, the relatively modest therapeutic results (only 5 out of the original 15 were rated as much improved or improved after treatment in the systematic desensitization group) could be due to placebo factors or the passage of time.

Thus, there is no experimental evidence that desensitization procedures increase heterosexual responsiveness. However, the clinical reports of success in the absence of aversion therapy would justify further investigation of these techniques.

SOCIAL RETRAINING

Another approach is assertive training, or a variant, behavior rehearsal. Essentially, these procedures teach new social skills to those patients who, because of avoidance or behavioral deficiencies, are unable to function effectively in heterosocial situations. In one of the first reports, using this

approach exclusively, Stevenson and Wolpe (1960) taught three sexual deviates to be more assertive. This resulted not only in the establishment or strengthening of social and sexual aspects of heterosexual behavior based on the patients' report, but also eliminated most deviant behavior. Edwards (1972) reported that a similar procedure was successful with a pedophilic.

As part of a comprehensive treatment program including aversion therapy, Cautela and Wisocki (1969) provided behavior rehearsals with a female to teach correct social and assertive behavior to six homosexuals who then reported increases in heterosexual responsiveness.

The establishment of adequate social behavior would seem to be a necessary precursor to sexual behavior. This approach is similar to techniques that Salter (1949) and Ellis (1956, 1959) use, in which homosexual activity is largely ignored and the patient is taught in the first instance to be more assertive, and second, is given instructions and encouragement on appropriate heterosocial and heterosexual behavior. Ellis (1956) reports 75% of a series of 40 homosexuals were improved. Improvement is not defined, however, and there is reason to believe that homosexual behavior had not diminished in the series. No follow-up is reported.

Although exact procedures are seldom reported, other clinicians practicing individual psychotherapy (Ovesey *et al.*, 1963) or group psychotherapy (Birk, Miller, & Cohler, 1970) describe the teaching of assertiveness and more effective heterosexual approach behavior during the course of therapy. It is possible that this aspect of therapy accounts for reports of success using this approach. In view of the seeming importance of teaching appropriate heterosocial behavior, it is surprising that no research at all has been reported in this area.

PAIRING

Another grouping of techniques shares a common basic procedure in which elicited sexual arousal is paired with heterosexual stimuli for the purpose of increasing heterosexual arousal. When close attention is paid to timing relationships, the procedure is sometimes called classical conditioning. In other reports it is called counterconditioning, or pairing. When masturbation is used to produce sexual arousal the procedure has been called masturbatory conditioning or orgasmic reconditioning.

Although the notion that sexual arousal patterns are learned through association is not new (Binet, 1888; Dollard & Miller, 1950), several analog studies have recently verified this hypothesis. Both Lovibond (1963) and Wood and Obrist (1968) conditioned autonomic responses to neutral stimuli that were repeatedly paired with sexual arousal. McConaghy (1970) paired erotic slides with geometrical configurations and

produced penile circumference changes to the configurations in 10 heterosexual and 15 homosexual subjects.

In a somewhat closer approach to the clinical situation, Rachman (1966) paired a slide picturing a pair of women's boots with slides of nude females and obtained increases in penile circumference to the boots in three volunteer, normal subjects, and later replicated these findings with five additional subjects (Rachman & Hodgson, 1968). These procedures were termed classical conditioning.

Early attempts at applying the principles of classical conditioning or pairing to clinical populations were made using hormonal injections to elicit sexual arousal (Freund, 1960; James, 1962). Freund (1960) was the first to attempt this in his pioneering report of the treatment of a series of male homosexuals. After a course of aversion therapy, 10 mg of testosterone propinate were injected and approximately 7 hr later pictures of nude or seminude women were shown to the patient. Results are reported for 47 patients. Forty and four-tenths percent made a "heterosexual adjustment" immediately following treatment. This percentage dropped to 25.5% after 3 yr. Unfortunately, it is not clear whether the "adjustment" was due to a drop in homosexual behavior, a rise in heterosexual behavior, or both, and there is no evidence that the hormone treatment increased heterosexual responsiveness.

In another physiological approach, Moan and Heath (1972) reported increased heterosexual responding in a homosexual after pairing heterosexual stimuli and behavior with septal stimulation.

In a procedure close to that employed by Rachman (1966), Beech, Watts, and Poole (1971) increased heterosexual arousal to mature females in a heterosexual pedophilic by pairing sexual arousal elicited by pictures of young females with slides of increasingly older females. Interest in young girls spontaneously declined although no aversion was used.

Several case studies have reported pairing sexual arousal produced by masturbation with heterosexual stimuli in the treatment of homosexuality (Thorpe, Schmidt, & Castell, 1963; Marquis, 1970; Annon, 1971), sadomasochism (Davison, 1968; Mees, 1966; Marquis, 1970), voyeurism (Jackson, 1969), and heterosexual pedophilia (Annon, 1971). In most cases, subjects are instructed to masturbate to a series of pictures or fantasies which progressively approximates the desired heterosexual activity.

Evidence for the efficacy of masturbatory conditioning does not go beyond the case study level. In only one case (Jackson, 1969) has this procedure been the sole therapeutic technique. However, it is interesting to note that pairing masturbatory arousal with various fantasies has been hypothesized to play an important role in the etiology of specific deviant sexual preferences. McGuire, Carlisle, and Young (1965) suggested that

deviates have some critical first sexual experience with a person or object which need not be sexually arousing at the time, but later provides a fantasy for masturbation. Historical evidence for the process is presented in a series of 45 deviates by McGuire *et al.* (1965) and in a second series reported by Evans (1968). Thus, altering masturbatory fantasy may be the most direct and efficient method of changing sexual preferences and deserves further investigation.

In one series of single case experiments the pairing procedure has been experimentally analyzed (Herman, Barlow, & Agras, in press). In this experiment the principles of classical conditioning were closely followed. Three exclusive male homosexuals chose slides or movies of males as unconditioned stimuli (UCS) and a female slide as the conditioned stimulus (CS). The experimental design consisted of backward pairing, classical conditioning, backward pairing, and classical conditioning once more. During backward pairing none of the three subjects showed any increase in heterosexual responsiveness as measured by penile changes to female slides and scores on attitude scales. During classical conditioning two subjects showed sharp increases in heterosexual arousal although one subject first required alteration of the temporal relationship of the CS and UCS. This arousal dropped somewhat after a return to the control phase and returned during the last classical conditioning phase. Homosexual responsiveness decreased to near zero for one subject but remained high for the second subject. The third subject demonstrated no clinically useful change during classical conditioning despite the presence of an adequate response to the UCS.

These studies suggest that classical conditioning is capable of increasing heterosexual arousal in homosexual patients. However, in all cases occasional procedural difficulties in temporal relationships between the CS and UCS and the maintenance of an adequate response to the UCS were noted. Furthermore, clinical follow-ups revealed that the two subjects who improved had difficulty in implementing their new-found heterosexual arousal, due to deficits in social skills.

This experimental evidence, along with evidence from analog studies, suggests that the various pairing procedures are therapeutically useful. Future research should determine the extent of their usefulness and the advantages and disadvantages of different methods of eliciting sexual arousal.

OTHER PROCEDURES

Several techniques have recently been reported which do not easily fit in the previous categories. Two of these procedures are based on operant methodology, a third employs intensive exposure to heterosexual stimuli.

Shaping. In case reports by Quinn, Harbison, and McAllister (1970) and Harbison, Quinn, and McAllister (1970) attempts were made to increase penile response to heterosexual stimuli through selective positive reinforcement, a technique better known as shaping, in two cases of homosexuality. After a course of aversion therapy the patients were fluid deprived and then reinforced with a drink of lime juice for longer heterosexual fantasies and/or progressively greater increases in penile circumference to slides of a nude female. Penile responses increased over the course of treatment as did the heterosexual score on an attitude scale. The homosexual score on the attitude scale also declined over pretreatment values. No report of behavior was given.

Fading. A second "operant" approach concentrates on introducing or "fading in" heterosexual stimuli during periods of sexual arousal in an effort to change stimulus control of sexual responsiveness. This technique has been investigated in a series of three controlled, single case experiments with homosexuals (Barlow & Agras, in press). In this procedure, one male and one female slide were superimposed on one another. Through the use of an adjustable transformer, an increase in the brightness of the female slide resulted in a simultaneous decrease in the brightness of the male slide. During treatment the female stimuli was faded in contingent on the subject maintaining 75% of a full erection as measured by a strain gauge device through a series of 20 steps ranging from 100% male brightness to 100% female brightness. The experimental design consisted of fading, a control procedure where fading was reversed or stopped, following by a return to fading.

The first homosexual completed the fading procedure in that he became sexually aroused to the female slide alone in six sessions. This arousal generalized to female slides in separate measurement sessions and to reports of behavior. In a control phase, when fading was reversed, heterosexual arousal and reports of behavior dropped considerably. When the female slide was faded in once more, heterosexual arousal increased. Homosexual responsiveness remained high throughout the experiment.

In the second experiment heterosexual arousal rose during the initial fading, continued rising, but then dropped sharply during a control phase in which fading was stopped at the half-way point and the slides shown separately, and rose once again when fading was reintroduced. Again, homosexual arousal remained high but had dropped sharply after termination, *without* therapeutic attempts to accomplish this goal, at follow-ups of 1 and 3 mo. This experimental procedure and result was replicated on a third homosexual.

Although these experiments suggest that a fading procedure is effective in instigating new patterns of sexual arousal, clinical assessments

following treatment indicated that the first two subjects needed training in heterosocial skills to implement their newly acquired arousal.

Exposure. One final technique to increase heterosexual responsiveness (Herman, Barlow, & Agras, 1971; Herman, 1971) involved exposing homosexuals to high intensity movies of a nude, seductive female. This technique was experimentally analyzed in three single cases with two homosexuals and a pedophilic.

The procedure was straightforward. An 8-mm movie of a nude, seductive female was shown daily for 10 min. During the control phase a movie of a nude, seductive male was shown accompanied by a therapeutic rationale. The third phase consisted of a return to the female exposure condition.

In all subjects, exposure to the female film increased heterosexual arousal. During the homosexual film, heterosexual arousal dropped for all subjects and rose once again when the heterosexual film was reintroduced. All subjects reported generalization to fantasies and behavior outside of treatment. Homosexual arousal had earlier been decreased in one subject through aversion therapy. In other subjects homosexual arousal did not decrease during treatment. Follow-ups of from 3 mo to 1 yr revealed that two subjects had difficulty in heterosexual relations, despite continued arousal, due to deficient social skills.

Although the experimental analysis isolates exposure as responsible for changes in patterns of sexual arousal, the mechanism of action is not clear. The authors consider that this process may be similar to the "flooding" or "implosion" treatment of fear (Stampfl & Lewis, 1967) which is consistent with the notion that heterophobia is a major component of sexual deviation. Another possibility is that it provides the subjects with new fantasy material which is then associated with sexual arousal outside treatment.

CONCLUDING COMMENTS

In view of the long-standing agreement among therapists on the importance of instigating heterosexual behavior, it is surprising how little research has been done. Thus the plethora of techniques described in this paper are more often based on assumption and hypothesis rather than evidence of effectiveness, although several different approaches do show promise.

Furthermore, these techniques often have different goals. For instance, systematic desensitization in the first instance is directed at reducing heterosexual "anxiety." Pairing procedures or fading techniques, on the other hand, are designed to instigate heterosexual arousal while social

retraining aims to teach adequate heterosocial skills. Many clinicians have concentrated on one of the above goals implicitly assuming that other appropriate behavior will follow. There is clinical evidence from our lab (Herman, 1971) and others (Annon, 1971) than an increase in heterosexual arousal is not always followed by acquisition of the necessary social skills to implement the arousal. On the other hand, many clinical anecdotes note that decreasing heterosexual anxiety or increasing heterosocial skills does not result in increased arousal. This suggests that heterosexual responsiveness is not a unitary concept, but actually consists of several distinct behavioral components. If this is the case, some combination of the above techniques such as a pairing procedure or fading techniques to instigate heterosexual arousal and social training to build heterosocial skills may constitute the most effective approach to the problem. Some patients may require intervention in only one area. There is an immediate need for a precise delineation of the various behavioral components constituting heterosexual responsiveness, and for the development of reliable and valid measurement devices to assess the extent of deficiencies in each component so that the appropriate technique or combination of techniques can be administered.

Finally, the relationship of aversion therapy and procedures to increase heterosexual responsiveness in the treatment of sexual deviation is not clear. Some evidence now exists suggesting that aversion therapy may not be necessary. In several cases where heterosexual responsiveness was increased without therapeutic attempts to suppress deviant responsiveness, deviant responses declined anyway, either during treatment (Kraft, 1967; Herman, 1971) or immediately after treatment (Barlow & Agras, in press). Since the ready use of aversive techniques has precluded this type of observation in most cases to date, more information is needed on the generality of this phenomenon and the patient variables which may predict its occurrence. Similarly, the observation noted independently by several investigators that aversive techniques alone set the occasion for rises in heterosexual responsiveness (Bancroft, 1971; Gelder & Marks, 1969; Barlow, Leitenberg, & Agras, 1969) is a paradoxical and puzzling phenomenon worthy of further investigation. This finding is reminiscent of side effects noted when aversive techniques are applied to disruptive behavior in children and psychotic adults. In these cases, socially appropriate behavior appears concurrent with deceleration of disruptive behavior and in the absence of any positive contingencies (Sajwaj & Risley, in press; Wahler, Sperling, Thomas, Teeter, & Luper, 1970). If this phenomenon is verified by future clinical research, then variables responsible for this effect should be isolated and arranged to maximize therapeutic benefit.

REFERENCES

ABEL, G., LEVIS, D., & CLANCY, J. Aversion therapy applied to taped sequences of deviate behavior in exhibitionism and other sexual deviation: A preliminary report. *Journal of Behavior Therapy and Experimental Psychiatry,* 1970, **1,** 59–60.

AGRAS, W. S., LEITENBERG, H., BARLOW, D. H., CURTIS, N. A., EDWARDS, J., & WRIGHT, D. The role of relaxation in systematic desensitization. *Archives of General Psychiatry,* 1971, **25,** 511–514.

ANNON, J. S. The extension of learning principles to the analysis and treatment of sexual problems. *Dissertation Abstracts International,* 1971, **32**(6-B), 3627.

BANCROFT, J. Aversion therapy of homosexuality: A pilot study of 10 cases. *British Journal of Psychiatry,* 1969, **115,** 1417–1431.

BANCROFT, J. A comparative study of aversion and desensitization in the treatment of homosexuality. In L. E. Burns and J. L. Worsley (Eds.), *Behaviour therapy in the 1970's.* Bristol: Wright, 1970. Pp. 12–33.

BANCROFT, J. The application of psychophysiological measures to the assessment and modification of sexual behavior. *Behaviour Research and Therapy,* 1971, **9,** 119–130.

BARLOW, D. H. Aversive procedures. In W. S. Agras (Ed.). *Behavior modification: principles and clinical applications.* Boston: Little, Brown, and Co., 1972. Pp. 87–125.

BARLOW, D. H., LEITENBERG, H., & AGRAS, W. S. The experimental control of sexual deviation through manipulation of the noxious scene in convert sensitization. *Journal of Abnormal Psychology,* 1969, **74,** 596–601.

BARLOW, D. H., & AGRAS, W. S. Fading to increase heterosexual responsiveness in homosexuals. *Journal of Applied Behavior Analysis,* in press.

BEECH, H. R., WATTS, F., & POOLE, A. D. Classical conditioning of sexual deviation: A preliminary note. *Behavior Therapy,* 1971, **2,** 400–402.

BIEBER, B., BIEBER, I., DAIN, H. J., DINCE, P. R., DRELLICH, M. G., GRUNDLACH, H. G., GRUNDLACH, R. H., KREMER, MALVINA W., WILBER, CORNELIA B., & BIEBER, T. D. *Homosexuality.* New York: Basic Books, 1963.

BINET, A. *Etudes de psychologie experimentale.* Paris, 1888.

BIRK, L., MILLER, E., & COHLER, B. Group psychotherapy for homosexual men by male–female cotherapists. *Acta Psychiatrica Scandinavica,* Supplementum **218,** 1970, 9–36.

BIRK, L., HUDDLESTON, W., MILLER, E., & COHLER, B. Avoidance conditioning for homosexuality. *Archives of General Psychiatry,* 1971, **25,** 314–323.

BOND, I., & EVANS, D. Avoidance therapy: Its use in two cases of underwear fetishism. *Canadian Medical Association Journal,* 1967, **96,** 1160–1162.

CAUTELA, J. R., & WISOCKI, P. A. The use of male and female therapists in the treatment of homosexual behavior. In R. Rubin and C. Franks (Eds.), *Advances in behavior therapy,* 1968. New York: Academic Press, 1969. Pp. 165–174.

COOPER, A. A. A case of fetishism and impotence treated by behavior therapy. *British Journal of Psychiatry,* 1963, **109,** 649–652.

DAVISON, G. C. Elimination of a sadistic fantasy by a client-controlled counterconditioning technique: A case study. *Journal of Abnormal Psychology,* 1968, **73,** 84–90.

DISCIPIO, W. Modified progressive desensitization and homosexuality. *British Journal of Medical Psychology,* 1968, **41,** 267–272.

DOLLARD, J., & MILLER, N. E. *Personality and psychotherapy.* New York: McGraw-Hill, 1950.

EDWARDS, N. B. Case conference: Assertive training in a case of homosexual pedophilia. *Journal of Behavior Therapy and Experimental Psychiatry,* 1972, **3,** 55–63.

ELLIS, A. The effectiveness of psychotherapy with individuals who have severe homosexual problems. *Journal of Consulting Psychology,* 1956, **20,** 58–60.

ELLIS, A. A homosexual treated with rational psychotherapy. *Journal of Clinical Psychology,* 1959, **15,** 338–343.

EVANS, D. R. Masturbatory fantasy and sexual deviation. *Behaviour Research and Therapy,* 1968, **6,** 17–19.

FELDMAN, M. P., & MACCULLOCH, M. J. The application of anticipatory avoidance learning to the treatment of homosexuality. I. Theory, technique, and preliminary results. *Behaviour Research and Therapy,* 1965, **2,** 165.

FELDMAN, M. P., & MACCULLOCH, M. J. *Homosexual behaviour: Theory and assessment.* Oxford, Pergamon Press, Ltd., 1971.

FOOKES, B. H. Some experiences in the use of aversion therapy in male homosexuality, exhibitionism, and fetishism–transvestism. *British Journal of Psychiatry,* 1968, **115,** 339–341.

FREUND, K. Some problems in the treatment of homosexuality. In Eysenck, H. J. (Ed.), *Behavior therapy and the neuroses.* London: Pergamon Press, 1960. Pp. 312–326.

FREUND, K., LANGEVIN, R., CIBIRI, S., & ZAJAC, Y. Heterosexual aversion in homosexual males. *British Journal of Psychiatry,* 1973, **122,** 163.

GAUPP, L. A., STERN, R. M., & RATLIFF, R. G. The use of aversion-relief procedures in the treatment of a case of voyeurism. *Behavior Therapy,* 1971, **2,** 585–588.

GELDER, M. G., & MARKS, I. M. Aversion treatment in transvestism and transsexualism. In R. Green (Ed.), *Transsexualism and sex reassignment.* Baltimore: Johns Hopkins Press, 1969. Pp. 383–413.

GRAY, J. J. Case conference: Behavior therapy in a patient with homosexual fantasies and heterosexual anxiety. *Journal of Behavior Therapy and Experimental Psychiatry,* 1970, **1,** 225–232.

HARBISON, J., QUINN, J., & MCALLISTER, H. The positive conditioning of heterosexual behavior. Paper presented to Conference on Behavior Modification, Dublin, 1970.

HERMAN, S. H. An experimental analysis of two methods of increasing heterosexual arousal in homosexuals. Unpublished Doctoral dissertation, University of Mississippi, 1971.

HERMAN, S. H., BARLOW, D. H., & AGRAS, W. S. Exposure to heterosexual stimuli: An effective variable in treating homosexuality? *Proceedings of the American Psychological Association 79th Annual Convention.* Washington, DC: American Psychological Association, 1971, pp. 699–700.

HERMAN, S. H., BARLOW, D. H., & AGRAS, W. S. An experimental analysis of classical conditioning as a method of increasing heterosexual arousal in homosexuals. *Behavior Therapy* (in press).

HUFF, F. The desensitization of a homosexual. *Behaviour Research and Therapy,* 1970, **8,** 99–102.

JACKSON, B. A case of voyeurism treated by counter-conditioning. *Behaviour Research and Therapy,* 1969, **7,** 133–134.

JAMES, B. Case of homosexuality treated by aversion therapy. *British Medical Journal,* 1962, **1,** 768–770.

KRAFT, T. A case of homosexuality treated by systematic desensitization. *American Journal of Psychotherapy,* 1967a, **21,** 815–821.

KRAFT, T. Behavior therapy and the treatment of sexual perversions. *Psychotherapy and Psychosomatics,* 1967b, **15,** 351–357.

KRAFT, T. Desensitization and the treatment of sexual disorders. *The Journal of Sex Research,* 1969a, **5,** 130–134.

KRAFT, T. Treatment for sexual perversions. *Behaviour Research and Therapy,* 1969b, **7,** 215.

LARSON, D. An adaptation of the Feldman and MacCulloch approach to treatment of homosexuality by the application of anticipatory avoidance learning. *Behaviour Research and Therapy,* 1970, **8,** 209–210.

LEVIN, S., HIRSCH, I., SHUGAR, G., & KAPCHE, R. Treatment of homosexuality and heterosexual anxiety with avoidance conditioning and systematic desensitization: Data and case report. *Psychotherapy: Theory, Research and Practice,* 1968, **5,** 160–168.

LOPICCOLO, J. Case study: Systematic desensitization of homosexuality. *Behavior Therapy,* 1971, **2,** 394–399.

LOVIBOND, S. H. Conceptual thinking, personality, and conditioning. *British Journal of Social Clinical Psychology,* 1963, **2,** 100–111.

MACCULLOCH, M. J., & FELDMAN, M. P. Aversion therapy in the management of 43 homosexuals. *British Medical Journal,* 1967, **2,** 594–597.

MARQUIS, J. N. Orgasmic reconditioning: Changing sexual object choice through controlling masturbation fantasies. *Journal of Behavior Therapy and Experimental Psychiatry,* 1970, **1,** 263–271.

MCCONAGHY, N. Subjective and penile plethysmograph responses following aversion relief and apomorphine aversion therapy for homosexual impulses. *British Journal of Psychiatry,* 1969, **115,** 723–730.

MCCONAGHY, N. Penile response conditioning and its relationship to aversion therapy in homosexuals. *Behavior Therapy,* 1970, **1,** 213–221.

MCGUIRE, R. J., CARLISLE, J. M., & YOUNG, B. G. Sexual deviations as conditioned behavior. *Behaviour Research and Therapy,* 1965, **2,** 185–190.

MEES, H. L. Sadistic fantasies modified by aversive conditioning and substitution: A case study. *Behaviour Research and Therapy,* 1966, **4,** 317–320.

MOAN, C. E., & HEATH, R. G. Septal stimulation for the initiation of heterosexual behavior in a homosexual male. *Journal of Behavior Therapy and Experimental Psychiatry,* 1972, **3,** 23–30.

MORGENSTERN, F. S., PEARCE, J. P., & REES, L. Predicting the outcome of behavior therapy by psychological tests. *Behaviour Research and Therapy,* 1965, **2,** 191–200.

OVESEY, L., GAYLIN, W., & HENDIN, H. Psychotherapy of male homosexuality. *Archives of General Psychiatry,* 1963, **9,** 19–31.

QUINN, J., HARBISON, J., & MCALLISTER, H. An attempt to shape human penile responses. *Behaviour Research and Therapy,* 1970, **8,** 213–216.

RACHMAN, S. Sexual fetishism: An experimental analogue. *The Psychological Record,* 1966, **16,** 293–296.

RACHMAN, S., & HODGSON, R. J. Experimentally induced "sexual fetishism": Replication and development. *The Psychological Record,* 1968, **18,** 25–27.

RADO, S. An adaptational view of sexual behavior. In P. Hoch and J. Zubin (Eds.), *Psychosexual development in health and disease.* New York: Grune and Stratton, 1949.

RAMSEY, R. W., & VAN VELZEN, V. Behaviour therapy for sexual perversions. *Behaviour Research and Therapy,* 1968, **6,** 17–19.

SAJWAJ, T. E., & RISLEY, T. R. Punishment techniques in behavior modification. *Journal of Applied Behavior Analysis* (in press).

SALTER, A. *Conditioned reflex therapy.* New York: Farrar, Strauss, 1949. Republished: New York: Capricorn Books, 1961.

SOLYOM, L., & MILLER, S. A differential conditioning procedure as the initial phase of behavior therapy of homosexuality. *Behaviour Research and Therapy,* 1965, **3**, 147–160.

STAMPFL, T. G., & LEVIS, D. J. Essentials of implosive therapy: a learning theory based psychodynamic behavioral therapy. *Journal of Abnormal Psychology,* 1967, **72**, 496–503.

STEVENSON, I., & WOLPE, J. Recovery from sexual deviation through overcoming non-sexual neurotic responses. *American Journal of Psychiatry,* 1960, **116**, 789.

THORPE, J., SCHMIDT, E., BROWN, P., & CASTELL, D. Aversion-relief therapy: A new method for general application. *Behaviour Research and Therapy,* 1964, **2**, 71–82.

THORPE, J., SCHMIDT, E., & CASTELL, D. A comparison of positive and negative (aversive) conditioning in the treatment of homosexuality. *Behaviour Research and Therapy,* 1963, **1**, 357–362.

WAHLER, R. G., SPERLING, K. A., THOMAS, M. R., TEETER, N. C., & LUPER, H. L. Modification of childhood stuttering: Some response–response relationships. *Journal of Experimental Child Psychology,* 1970, **9**, 411–428.

WEST, D. J. *Homosexuality.* 3rd Edition. London: Penguin Books, 1968.

WICKRAMASEKERA, I. The application of learning theory to the treatment of a case or sexual exhibitionism. *Psychotherapy: Theory, Research, and Practice,* 1968, **5**, 108–112.

WOOD, D., & OBRIST, P. Minimal and maximal sensory intake and exercises as unconditioned stimuli in human heart-rate conditioning. *Journal of Experimental Psychology,* 1968, **76**, 254–262.

WOLPE, J. *The practice of behavior therapy.* New York: Pergamon Press, 1969.